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EXAMINER	
NELSON, ALECIA DIANE	

ART UNIT	PAPER NUMBER
2675	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/007,118	DALY, SCOTT J.	
	Examiner	Art Unit	
	Alecia D. Nelson	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. ***Claims 1-22*** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. **Claims 1, 15, 19, and 21** contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The above claims now require that the transmittance of the light valve is varied in a non-binary manner. The specification describes that the transmittance of the light valve is reduced (page 6, line 25) and that reducing the illumination of the backlight light source for a pixel wile reducing the light valve alters the slope of the grayscale. However there is no description given in the specification to the new claim limitation. **Claims 2-24, 16-18, 20, and 22** are rejected as being dependent on a rejected base claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless-

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351 (a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. ***Claims 1, 2, 4, 6, 13, 14, and 19-22*** are rejected under 35 U.S.C. 102(e) as being anticipated by Fuller (US 2002/0171617 A1).

As pertaining to **claim 1**, Fuller teaches the method of illuminating a backlit display (130) by varying a luminance of a light source (124) illuminating a displayed pixel in response to an intensity value of said pixel (see paragraphs (18, 34, and 39) and varying the transmittance of a light valve (112) of the display in a non-binary manner (see paragraphs 38-39).

As pertaining to **claim 2**, Fuller teaches a) determining a luminance of said pixel from said intensity value and b) varying a luminance of said light source according to a relationship of said luminance of said pixel and said luminance of said light source (paragraphs: 39). **Claim 2** is dependent on **claim 1** and is rejected on the same basis and what is stated above.

As pertaining to **claim 4,** Fuller teaches wherein the step of determining a luminance of a pixel from an intensity value comprises the step of filtering an intensity value for a plurality of pixels (see paragraph 71). **Claim 4** is dependent on **claims 1-2** and is rejected on the same basis and what is stated above.

As pertaining to **claim 6,** Fuller teaches all that is required as explained above with reference to claim 1. Fuller further teaches the step of sampling a filtered intensity value at a spatial coordinate (each active cell) to the light source (see paragraphs 37-39).. **Claim 6** is dependent on **claims 1-2 and 4** and is rejected on the same basis and what is stated above.

As pertaining to **claim 13,** Fuller teaches the step of varying a luminance of a plurality of light sources illuminating a plurality of displayed pixels substantially comprising a frame in a sequence of video frame (paragraphs: 13-19). **Claim 13** is dependent on **claim 1** and is rejected on the same basis and what is stated above.

As pertaining to **claim 14,** Fuller teaches a frame in sequence of video frames comprises the step of varying said luminance of said light sources for less than all frames of said sequence (paragraphs: 58-63 figs. 5-6). **Claim 14** is dependent on **claims 1 and 13** and is rejected on the same basis and what is stated above.

As pertaining to independent **claim 19,** Fuller teaches a plurality of light source elements (124) (paragraph: 34); a light valve (112) arranged for locally modulated transmittance of light form said light source elements (124), said locally modulated transmittance being responsive to a data value 51 of an image pixel (paragraphs: 38-39); and a light source controller (BCK) to modulate a luminance output of alight source

element according to a relationship of said luminance output and data value of image pixel (paragraph: 61).

As pertaining to **claim 20,** Fuller teaches a video controller (800) that receives and processes the initial video signal to generate and transmit the adjusted video signal to the cells. The video controller also allows generating the backlight signal (see paragraph 64). Further it would be an inherent feature to allow some type of device, i.e., data processing unit or image processor or generator or controller etc., would have the capabilities to provide how much power is needed to drive each light source in order to display the luminance of pixels because it has the "information" or "instructions" regarding the image to be displayed, furthermore, it would be obvious that the light element or light source driver would provide power to the light source elements. **Claim 20** is dependent on **claim 19** and is rejected on the same basis and what is stated above.

As pertaining to **claim 21,** Fuller teaches a display comprising a plurality of light sources (124), at least one light source being controllable to output light at a luminance level independent of a luminance level of light output by another of said light source (paragraph: 39).

As pertaining to **claim 22,** the light source driver controlling said luminance level of light output by said at least one light source according to a relationship of said

luminance level of said output light and a data value for a display pixel (paragraphs: 43-57; 64). **Claim 22** is dependent on **claim 21** and is rejected on the same basis and what is stated above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. ***Claims 3, 5, and 7*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller in view of Nagai (US 2002/0135553 A1).

As pertaining to **claims 3 and 5**, Fuller teaches all that is required as explained above with reference to **claim 1**. While Fuller fails to specifically teach the nonlinear relationship between the luminance of the pixel and the luminance of the light source it is taught that the luminance of the pixel and the light source are determined independently of one another. Wherein the transmitted video signal controls the active element (pixel) by controlling the alignment of the liquid crystal molecules of the cell and as a result the transmittance of the liquid crystal element of the cell. The video signal controls the proportion of the received backlight signal that the cell internally transmit to its color filter element.(see paragraphs 34, 38, 41, and 44).

Therefore it would have been obvious to allow for a nonlinear relationship between the pixel and the light source as suggest by and carried out in the device of Fuller in order to provide a system wherein the backlight control signal and the video signal are determined for a given frame to be displayed by the display arrangement. This allows for modulating and more precisely lowering the backlight signal, through the modulation of the backlight control signal (see paragraph 18).

As pertaining to **claim 7**, it would be obvious that Fuller and Nagai discloses the rescaling a sample of the filtered intensity value to reflect a nonlinear relationship between the luminance of the light source and intensity of the pixel (figs. 12-13). Claim 7 is dependent on **claims 1-2, 4 and 6** and is rejected on the same basis and what is stated above.

7. ***Claim 8*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller in as applied to **claim 1** above, and further in view of Kabel et al. (hereinafter "Kabel"), US 6,590,561 B1.

As pertaining to **claim 8,** Fuller discloses what has previously been stated above. However fails to disclose that the light source operates at a substantially maximum luminance if the luminance of at least one displayed pixel exceeds a threshold luminance.

As pertaining to **claim 8,** Kabel discloses a method in which a dimming operation occurs in which if it exceeds a threshold it, the light source, will not turn off. The flow

chart of fig. 2 follows: The dimming routine begins when the controller 22 senses a request to dim the display module 16 as depicted in step 200 of FIG. 2. For example, an operator wishing to dim an image may press a down arrow or operate a slide bar on the user interface 24. The controller 22 then determines if the lowest threshold of the backlight 12 or a pre-selected threshold level has been reached as depicted in step 202. The lowest threshold of the back light 12 is pre-selected and may be any percentage of the full brightness of the back light 12. For example, through experimentation, it may be determined that the backlight 12 ceases to emit appreciable light at a power level of 25°/a. This 25°/a level may then be preset as the lowest threshold for the back light 12. If the lowest threshold of the back light 12 has not been reached, the program proceeds to step 204 where the controller 22 dims the back light 12 the amount requested by the user interface 24 to reduce the amount of light passing through the display module 16. The routine then starts over to await further requests to dim the display module 16. If the controller 22 determines that the lowest or pre-selected threshold of the back light 12 has been reached in step 202, the routine proceeds to step 206 where the controller 22 determines whether the lowest threshold of the pixels has been reached. The lowest threshold for the pixels may be pre-selected and may be any percentage of the normal voltage levels for the pixels. For example, it may be determined that the pixels fail to operate properly if their voltage level is reduced by more than 75%. If so, 25% of the pixels' normal operating voltage maybe preset as the lowest threshold for the pixels. If the lowest threshold for the pixels has been reached, the routine ceases dimming the display module 16. If, however, the lowest threshold for the pixels has not been reached

in step 206, the routine proceeds to step 208 where the controller 22 proportionally adjusts the voltage level of all active pixels. The user interface 24 and the controller 22 may be configured to reduce the voltage levels delivered to the pixels in discrete steps or may provide an analog, infinite amount of reduction levels. It would be obvious that if this method can be used for dimming it further can used to brighten a display.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method of Kabel with that of Fuller.

The suggestion/motivation for doing so would have been to provide for a display that can operate at full on luminance and intensity when desired and when not. This allows for a user to see, as if, the display is at a better resolution, better contrast etc. (see column 1, line 38-column 2, line14). Again, Kabel operates for dimming the display but it would be obvious that it can operate in the opposite direction and be used for brightening a display. **Claim 8** is dependent on **claims 1-2** and is rejected on the same basis and what is stated above.

8. ***Claims 9-12*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller and Kabel as applied to claim 1 or 2 or 8 above, and further in view of Lim et al. (hereinafter "Lim"), US 2003/0057253 A1.

As pertaining to **claim 9**, Fuller and Kabel disclose what has previously been stated above, however fails to disclose the step of attenuating the light source according to the relationship of said luminance of light source and a mean luminance of pixels.

As pertaining to **claim 9**, Lim discloses the attenuating the light source according to the relationship of said luminance of light source and a mean luminance of pixels (paragraphs: 0024, 0047 and abstract).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method of attenuating of Lim with that of Fuller and Kabel.

The suggestion/motivation for doing so would have been to provide for better display that will have a different way of illuminating itself. This will allow for higher contrast and resolution and further improve the dynamic range. **Claim 9** is dependent on **claims 1-2 and 8** and is rejected on the same basis and what is stated above.

As pertaining to **claim 10,** Fuller teaches the step of varying a luminance of a plurality of light sources illuminating a plurality of displayed pixels substantially comprising a frame in a sequence of video frame (paragraphs: 13-19). **Claim 13** is dependent on **claim 1** and is rejected on the same basis and what is stated above.

As pertaining to **claim 11,** Fuller teaches a frame in sequence of video frames comprises the step of varying said luminance of said light sources for less than all frames of said sequence (paragraphs: 58-63 figs. 5-6). **Claim 14** is dependent on **claims 1 and 13** and is rejected on the same basis and what is stated above.

As pertaining to **claim 12**, Fuller teaches that the plurality of pixels comprises at least two contiguous pixels (figs. 5-6) **Claim 12** is dependent on **claims 1-2 and 8-9** and is rejected on the same basis and what is stated above.

9. ***Claim 15*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai in view of Fuller,

As pertaining to independent **claim 15**, Nagai discloses determining a luminance of a pixel of an image from a data value for said pixel (paragraphs: 0024-0027, 0033-0038, 00650079, 0116-0122; fig. 18; abstract); filtering said luminance, Nagai discloses as depicted by figure 1 and figure 20, a polarizing conversion optical system 65 that is used to filter only P+S waves, thus allowing on the P waves to pass through. It is obvious that the polarizing conversion optical system 65 allows for filtering of the P wave, which would encompass the intensity values of the pixels (paragraphs: 0110-0112, 0254-0260); determining a maximum of said filtered luminance for a plurality of pixels illuminated by alight element of a backlight (paragraphs: 0119, 0152); determining a statistical value of said filtered luminance for a plurality of pixels illuminated said light element and illuminating said light element according to a relationship of said maximum and said filtered luminance and said statistical value of said filtered luminance (paragraphs: 0110-0112, 0116-0122, 0254-0260).

Nagai fails to teach that the pixels are composed of a type of liquid crystal material, which allows for varying the transmittance of a light valve of said display in a non-binary manner.

Fuller teaches the usage of a liquid crystal layer (112) composed of almost transparent substances exhibiting the properties of both solid and liquid matters. Light passing through the liquid crystal layer (112) follows the alignment of the molecules that make up the liquid crystal. Charging the liquid crystal molecules with electricity changes the molecular alignment and consequently the way the light passes through them (see paragraph 32).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the usage of a liquid crystal layer as taught by Fuller in a device with capabilities similar to that which is taught by Nagai in order to allow variable intensity of the display which is controlled by the backlight as well as the liquid crystal, thereby reducing power consumption to control the backlight.

10. ***Claim 16*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai in view of Fuller as applied to **claim 15** above, and further in view of Lim.

As pertaining to **claim 16**, Nagai and Fuller disclose what has previously been stated above however fail to disclose the statistical value of said luminance comprises a mean luminance of plurality of pixels.

As pertaining to **claim 16,** Lim discloses the statistical value of said luminance comprises a mean luminance of plurality of pixels (paragraphs: 0024, 0047 and abstract).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method of Lim with that of Nagai and Fuller.

The suggestion/motivation for doing so would have been to provide for better display that will have a different way of illuminating itself. This will allow for higher contrast and resolution and further improve the dynamic range. **Claim 16** is dependent on **claim 15** and is rejected on the same basis and what is stated above.

11. ***Claims 17-18*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai and Fuller as applied to **claim 16** above, and further in view of Kabel.

As pertaining to **claim 17**, Nagai and Fuller disclose what has previously been stated above however, do not disclose the light source operates at a substantially maximum luminance if the luminance of at least one displayed pixel exceeds a threshold luminance.

As pertaining to **claim 17,** Kabel discloses a method in which a dimming operation occurs in which if it exceeds a threshold it, the light source, will not turn off. The flow chart of fig. 2 follows: The dimming routine begins when the controller 22 senses a request to dim the display module 16 as depicted in step 200 of FIG. 2. For example, an operator wishing to dim an image may press a down arrow or operate a slide bar on the user interface 24. The controller 22 then determines if the lowest threshold of the backlight 12 or a pre-selected threshold level has been reached as depicted in step 202. The lowest threshold of the back light 12 is pre-selected and may be any percentage of the full brightness of the back light 12. For example, through

experimentation, it may be determined that the backlight 12 ceases to emit appreciable light at a power level of 25°/a. This 25% level may then be preset as the lowest threshold for the back light 12. If the lowest threshold of the back light 12 has not been reached, the program proceeds to step 204 where the controller 22 dims the back light 12 the amount requested by the user interface 24 to reduce the amount of light passing through the display module 16. The routine then starts over to await further requests to dim the display module 16. If the controller 22 determines that the lowest or pre-selected threshold of the back light 12 has been reached in step 202, the routine proceeds to step 206 where the controller 22 determines whether the lowest threshold of the pixels has been reached. The lowest threshold for the pixels may be pre-selected and may be any percentage of the normal voltage levels for the pixels. For example, it may be determined that the pixels fail to operate properly if their voltage level is reduced by more than 75%. If so, 25% of the pixels' normal operating voltage may be preset as the lowest threshold for the pixels. If the lowest threshold for the pixels has been reached, the routine ceases dimming the display module 16. If, however, the lowest threshold for the pixels has not been reached in step 206, the routine proceeds to step 208 where the controller 22 proportionally adjusts the voltage level of all active pixels. The user interface 24 and the controller 22 may be configured to reduce the voltage levels delivered to the pixels in discrete steps or may provide an analog, infinite amount of reduction levels. It would be obvious that if this method can be used for dimming it further can used to brighten a display.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method of Kabel with that of Nagai and Fuller.

The suggestion/motivation for doing so would have been to provide for a display that can operate at full on luminance and intensity when desired and when not. This allows for a user to see, as if, the display is at a better resolution, better contrast etc. Again, Kabel operates for dimming the display but it would be obvious that it can operate in the opposite direction and be used for brightening a display. **Claim 17** is dependent on **claims 15-16** and is rejected on the same basis and what is stated above.

As pertaining to **claim 18,** Nagai discloses the statistical value of luminance of plurality of pixels and luminance level of light sources is nonlinear (figs. 12-13, 18). **Claim 18** is dependent on **claims 15-17** and is rejected on the same basis and what is stated above.

Response to Arguments

12. Applicant's arguments with respect to ***claims 1-22*** have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alecia D. Nelson whose telephone number is (703) 305-0143. The examiner can normally be reached on Monday-Friday 9:30-6:00. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

adn/ADN
July 23, 2004